DOENÇAS PANCREÁTICAS

Wagner Sato Ushikoshi
Anhembi-Morumbi

Insuficiência pancreática exócrina

- deficiência de enzimas pancreáticas devido a atrofia acinar pancreática, geralmente de causa idiopática
- não há envolvimento do pâncreas endócrino (exceção na pancreatite crônica)
- ocorre geralmente em animais jovens de (1 a 5 anos de idade)
- raças predispostas: pastor alemão (pancreatite linfocítica)

Insuficiência pancreática exócrina

- sintomas de síndrome de mal digestão
  - diarréia crônica (95%)
  - emagrecimento (87%)
  - polifagia (52%)
  - êmese (24%)
  - borborigmas / flatulência

Insuficiência pancreática exócrina

- diagnóstico
  - TLI (*trypsin-like immunoreactivity*) em jejum
    - alta sensibilidade e especificidade
    - normal: 5 - 35 μg/l
    - suspeito: 3 - 5 μg/l
    - IPE: < 2,5 μg/l
  - diagnóstico terapêutico (?)

Insuficiência pancreática exócrina

- tratamento
  - suplementação com pancreatina
    - 1 colher das de chá / 10-20 kg junto com a dieta
  - dieta com alta digestibilidade, restrição de gordura e pouca fibra???
  - suplementação com cobalamina
    - 100 - 250 mg/semana, pelo menos 1 mês
  - antibiótico
    - oxitetraciclina ou metronidazol

Abdomen agudo

- presença súbita de desconforto ou dor abdominal
- associado com vários processos e doenças e deve ser considerado uma situação emergencial

Box 2. Etiology of acute abdomen in the dog and cat

- Urologic system
  - Bladder
    - Disruption*
    - Neoplasia
    - Urolithiasis
    - Obstruction*
    - Infection
  - Urethra
    - Disruption
    - Neoplasia
    - Urolithiasis
    - Obstruction
  - Ureter(s)
    - Disruption
    - Neoplasia
    - Urolithiasis
    - Obstruction
  - Renal pelvis
    - Disruption
    - Urolithiasis
    - Infection (pyelonephritis)
  - Kidney
    - Infection
    - Neoplasia
    - Acute nephritis
    - Renal ischemia
- Hemolymphatic
  - Spleen
    - Neoplasia*
    - Torsion
    - Infarction
    - Splenitis
    - Abscess
    - Hematoma
    - Laceration
  - Lymph nodes
    - Reactive lymphadenopathy
    - Lymphadenitis
    - Neoplastic infiltrate
- Genital
  - Male
    - Prostate
      - Prostatitis
      - Abscess
      - Cyst
      - Neoplasia
    - Testicular torsion (abdominal)
  - Female
    - Uterus
      - Pyometra*
      - Torsion
      - Acute metritis
      - Neoplasia
      - Dystocia
      - Rupture
    - Ovary(ies)
      - Ovarian neoplasia
      - Ovarian cyst
- Peritoneum/retroperitoneum/vascular
  - Peritonitis
    - Septic*
    - Chemical
      - Uroperitoneum*
      - Bile
    - Pancreatitis*
  - Hemoperitoneum*
  - Hemoretroperitoneum
  - Disseminated neoplasia
  - Vascular
    - Mesenteric avulsion
    - Mesenteric volvulus
    - Mesenteric artery thrombosis
    - Portal vein thrombosis
- Gastrointestinal system
  - Stomach
    - Gastric dilatation-volvulus (GDV)*
    - Gastric dilatation (GD)*
    - Ulceration/perforation
    - Gastroesophageal reflux
    - Neoplasia
    - Obstruction*
    - Foreign body*
    - Ischemia
    - Acute gastritis

- Small bowel
  - Obstruction*
    - Foreign body*
    - Ulceration/perforation
    - Gastroduodenal intussusception
    - Intussusception
    - Ischemia
    - Neoplasia
    - Enteritis*
    - Ileocecocolic intussusception
  - Large bowel
    - Neoplasia
    - Torsion
    - Ulceration/perforation
    - Ischemia
    - Colitis
    - Obstruction
    - Ileus
    - Cecal inversion
    - Typhlitis
- Hepatobiliary
  - Hepatic
    - Hepatic lobar torsion
    - Hepatic hematoma
    - Hepatic abscess
    - Hepatitis
    - Laceration
    - Cholangiohepatitis
  - Biliary
    - Biliary obstruction
    - Cholecystitis
    - Gallbladder mucocele
    - Cholelithiasis
    - Biliary disruption
      - Common bile duct
      - Gallbladder
      - Hepatic duct
- Pancreatic
  - Pancreatitis*
  - Abscess
  - Neoplasia
  - Pseudocyst
  - Necrosis caused by ischemia
- Mesenteric
  - Mesentery
    - Rent with herniation
    - Neoplasia
- Body wall/skin and subcutaneous tissue
  - Body wall
    - Prepubic tendon avulsion
    - Penetrating injury
    - Hematoma
    - Hernia
    - Abscess
    - Neoplasia
  - Skin and subcutaneous tissue
    - Penetrating injury
    - Abscess
- Referred pain and acute abdomen
  - Intervertebral disc disease*
  - Discospondylitis
  - Spinal neoplasia
  - Fracture/luxation
  - Pelvic trauma

Common conditions are indicated by an asterisk.

BEAL, MW. Approach to the Acute Abdomen. *Vet Clin Small Anim*, v.35, p.375–396, 2005.

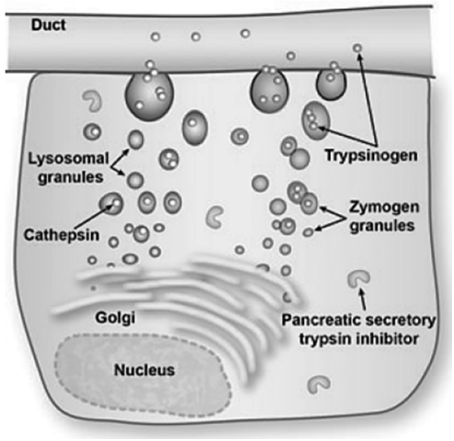
Pancreatite

- inflamação do pâncreas por ativação das enzimas pancreáticas dentro das células acinares que promove a sua autodigestão

Pancreatite

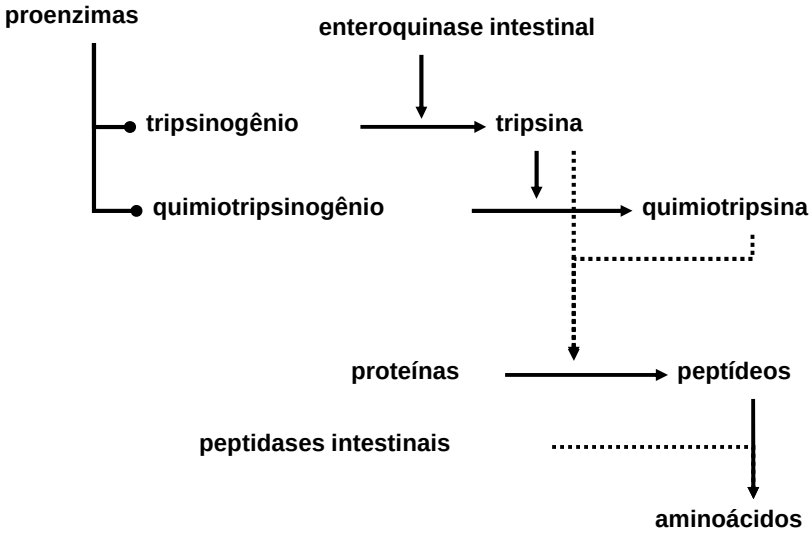
- mecanismos de proteção
  - produção de enzimas inativadas na forma de grânulos de zimógenos que são clivadas para a forma ativa no intestino
    - grânulos de zimógenos e as enzimas lisossomais estocados em separado nas células acinares
  - inibidor de tripsina pancreática secretória que inativa a tripsina na célula acinar
    - pancreatic secretory trypsin inhibitor (PSTI)
  - antiproteases séricas que inibem a tripsina liberada na circulação

Patofisiologia

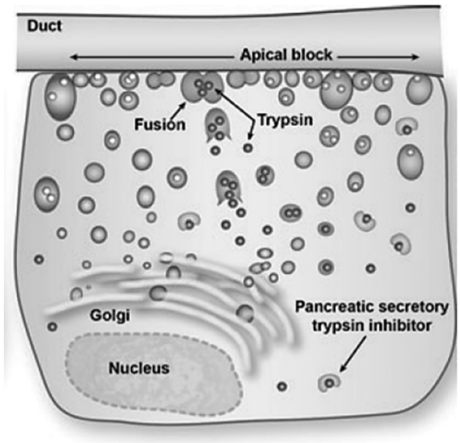


MANSFIELD, C. Pathophysiology of Acute Pancreatitis: Potential Application from Experimental Models and Human Medicine to Dogs. J Vet Intern Med 2012;26:875–887

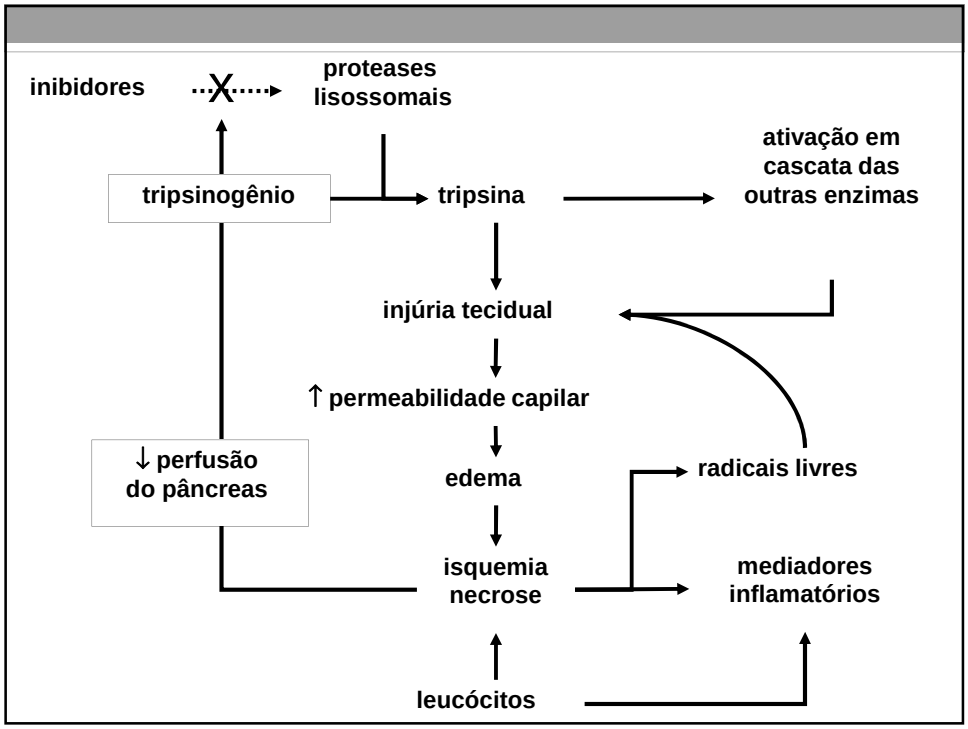
Pâncreas normal



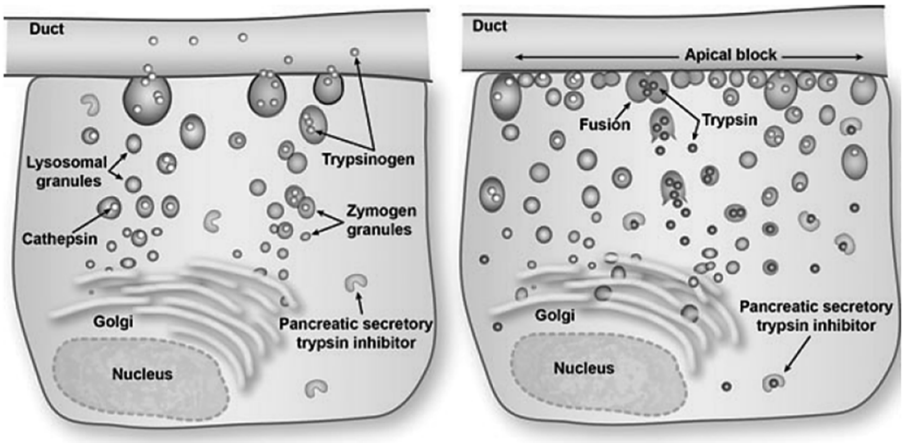
Patofisiologia da pancreatite



MANSFIELD, C. Pathophysiology of Acute Pancreatitis: Potential Application from Experimental Models and Human Medicine to Dogs. J Vet Intern Med 2012;26:875–887



Patofisiologia



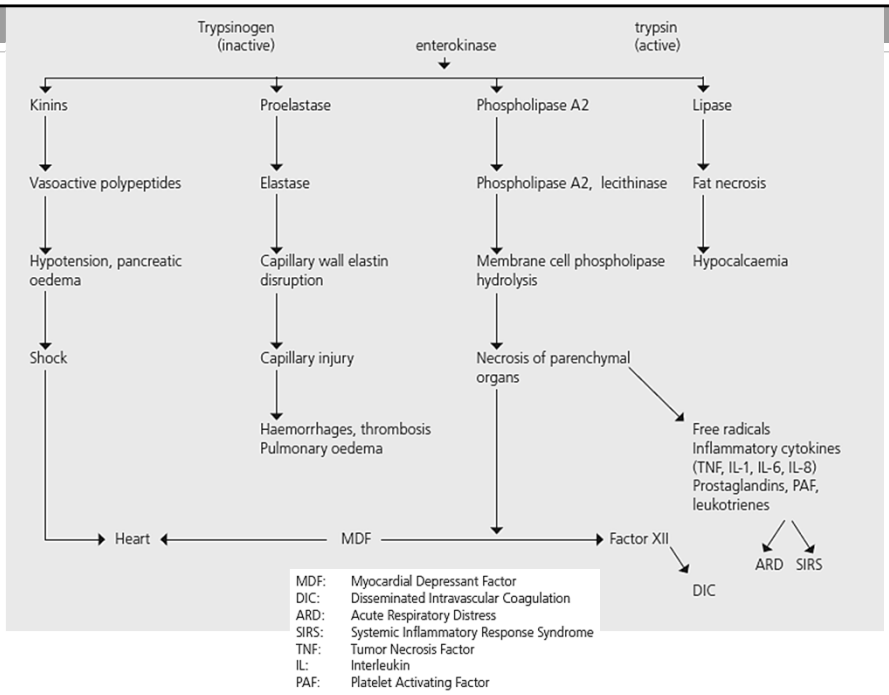
MANSFIELD, C. Pathophysiology of Acute Pancreatitis: Potential Application from Experimental Models and Human Medicine to Dogs. J Vet Intern Med 2012;26:875–887

Pancreatite

- fatores associados
  - raça (schnauzer, terriers)
  - idade > 5 anos
  - doenças endócrinas
    - hiperlipidemia, hipotireoidismo, DM, HAC
  - obesidade / dieta
  - drogas (azatioprina, brometo de potássio)
  - doença gastrointestinal
  - trauma abdominal

Pancreatite

- sintomas dependem da severidade do quadro
  - leve
    - assintomático / inespecífico
  - moderado / severo
    - anorexia, êmese, diarréia, dor abdominal, febre e icterícia
  - fatal
    - choque, dispnéia aguda, SIRS, CID



Pancreatite

- diagnóstico
  - sintomas / histórico
  - imagem
    - RX (24%), US (68%)
  - amilase / lipase
    - baixa sensibilidade e especificidade
  - lipase pancreática específica (PL)
  - laparotomia

Pancreatite

J Vet Intern Med 2012;26:888–896

A Multi-Institutional Study Evaluating the Diagnostic Utility of the Spec cPL™ and SNAP® cPL™ in Clinical Acute Pancreatitis in 84 Dogs

K. McCord, P.S. Morley, J. Armstrong, K. Simpson, M. Rishniw, M.A. Forman, D. Biller, N. Parnell, K. Arnell, S. Hill, S. Avgeris, H. Gittelman, M. Moore, M. Hitt, G. Oswald, S. Marks, D. Burney, and D. Twedt

Background: Pancreas-specific lipase is reported to aid in diagnosing acute pancreatitis (AP) in dogs but has not been rigorously evaluated clinically.

Hypothesis/Objectives: To describe variability of disease in dogs with suspected clinical AP, and to evaluate accuracy of 2 pancreatic-specific lipase immunoassays, Spec cPL (SPEC) and SNAP cPL (SNAP), in diagnosing clinical AP. We hypothesized that SPEC and SNAP provide better diagnostic accuracy than serum amylase or total lipase.

Animals: A total of 84 dogs; 27 without AP and 57 with clinical signs associated with AP.

Methods: Multicenter study. Dogs were prospectively enrolled based upon initial history and physical examination, then retrospectively classified into groups according to the likelihood of having clinical AP by a consensus of experts blinded to SPEC and SNAP results. Bayesian latent class analyses were used to estimate the diagnostic accuracy of SPEC and SNAP.

Results: The estimates for test sensitivities and specificities, respectively, ranged between 91.5–94.1% and 71.1–77.5% for SNAP, 86.5–93.6% and 66.3–77.0% for SPEC (cutoff value of 200 μg/L), 71.7–77.8% and 80.5–88.0% for SPEC (cut-off value of 400 μg/L), and were 52.4–56.0% and 76.7–80.6% for amylase, and 43.4–53.6% and 89.3–92.5% for lipase.

Conclusions and Clinical Importance: SNAP and SPEC have higher sensitivity for diagnosing clinical AP than does measurement of serum amylase or lipase activity. A positive SPEC or SNAP has a good positive predictive value (PPV) in populations likely to have AP and a good negative predictive value (NPV) when there is low prevalence of disease.

Key words: Canine; Clinical; Diagnosis; Lipase.

Pancreatite

- tratamento
  - analgesia com opióides
    - fentanil / morfina / meperidina
  - controle da êmese
    - ondansedrona / ranitidina
  - fluidoterapia agressiva
    - melhora da perfusão tecidual
    - cristalóides / colóides / plasma (?)

Retrospective Study

Journal of Veterinary Emergency and Critical Care 19(6) 2009, pp 617–622
doi:10.1111/j1476-4431.2009.00483.x

Evaluation of fresh frozen plasma administration in dogs with pancreatitis: 77 cases (1995–2005)

Linda K. Weatherton, DVM and Elizabeth M. Streeter, DVM, DACVECC

Abstract

Objective – Compare outcome of dogs that did and did not receive fresh frozen plasma (FFP) for treatment of pancreatitis.
Design – Retrospective case series between 1995 and 2005.
Setting – University referral hospital.
Animals – Seventy-four dogs were enrolled with a total of 77 cases as 2 dogs had repeat episodes of pancreatitis. Diagnosis of pancreatitis was based on clinical signs, physical examination, and abdominal ultrasonographic examination.
Interventions – The medical database was searched for dogs with a diagnosis of pancreatitis. Information collected included signalment, vital signs, CBC, use of FFP, length of stay, use of antimicrobials and supplemental nutrition, surgical intervention, preexisting illness, evidence of a coagulopathy and outcome. Outcome was compared between those patients that did and did not receive FFP.
Measurements and Main Results – Fifty-nine dogs survived to discharge. Two dogs with repeat pancreatitis survived to discharge after each episode. Thirteen dogs died and 2 were euthanized. FFP was administered to 20 dogs. Two dogs that were hospitalized for repeat pancreatitis did not receive FFP. Seven of 20 (35%) cases that received plasma died or were euthanized compared with 6 of 57 (12%) cases that did not receive plasma. Plasma administration was significantly related to outcome ($P < 0.001$). Severity of illness scores were difficult to assign, however, dogs meeting criteria for systemic inflammatory response syndrome were not more likely to receive FFP. Other therapies included supplemental nutrition, antimicrobials, and surgical intervention, which did not affect outcome.
Conclusions – Mortality rate for those dogs receiving plasma was higher than those that did not. Severity of illness scores were difficult to assign; however, preexisting illness, evidence of systemic inflammatory response syndrome, and presence of a coagulopathy were not significantly different between the groups that did and did not receive FFP. No benefit for administration of FFP was noted. Additional investigation should be performed to confirm this result.

(J Vet Emerg Crit Care 2009; 19(6): 617–622) doi: 10.1111/j.1476-4431.2009.00483.x

Keywords: α-macroglobulins, antiproteases, coagulopathy, systemic inflammatory response syndrome

Pancreatite

- tratamento
  - dieta
    - nutrição parental pouco indicada devido as complicações
    - enteral espontânea, por sonda esofágica, nasogástrica ou jejunostomia
    - dieta pobre de gordura!!!
  - antibiótico de amplo espectro
    - enrofloxacina
  - cirúrgico

Pancreatite

- prognóstico
  - exames laboratoriais
    - hemograma e plaquetas
    - uréia e creatinina
    - ALT, FA
    - glicemia / β-hidoxibutirato
    - pH sanguíneo

Table 1: Severity score based on organ system compromise in spontaneous canine AP*

System	Criterion	Reference range
Lymphoid	>10% band neutrophils or WBC > 24×10^9/L	0.0–0.2 $\times 10^9$/L band neutrophils 4.5–17.0 $\times 10^9$/L WBC
Renal	BUN > 14 mmol/L or creatinine (39 mg/dL) Concentration >0.3 mmol/L (3.4 mg/dL)	2.5–9.5 mmol/L BUN (7–21 mg/dL) 0.06–0.18 mmol/L creatinine (0.7–2.0 mg/dL)
Hepatic	ALP, AST, or ALT >3 × reference range	0–140 IU/L ALP 15–80 IU/L AST 15–80 IU/L ALT
Acid/base buffering†	Bicarbonate <13 or >26 mmol/L and/or anion gap <15 or >38 mmol/L	15–24 mmol/L bicarbonate 17–35 mmol/L anion gap
Endocrine pancreas†	Blood glucose >13 mmol/L and/or β-OH (232 mg/dL) Butyrate >1 mmol/L	3.3–6.8 mmol/L blood glucose (59–121 mg/dL) 0–0.6 mmol/L β-OH butyrate

*Reproduced with permission from: Ruaux CG, Atwell RB. A severity score for spontaneous canine acute pancreatitis. Aust Vet J 1998; 76(12):804–808.
†If hyperglycemia, increased butyrate and acidosis coexist, count as one system.
AP, acute pancreatitis; WBC, white blood cell count; BUN, blood urea nitrogen; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase.

Table 3. Mortality rates because of disease, and of the whole group including euthanasia, in 68 cases of spontaneous canine acute pancreatitis, analysed against score for organ system compromise.

Organ score	n	Died of acute pancreatitis (%)	Euthanased (%)	Percent mortality for all causes
0	19	0 (0)	0 (0)	0
1	18	1 (5.5)	1 (5.5)	11.1
2	15	3 (20)	0 (0)	20
3	9	5 (55.5)	1 (11)	66.6
4	7	2 (28.6)	5 (71)	100